Open Ended Final Exam Review

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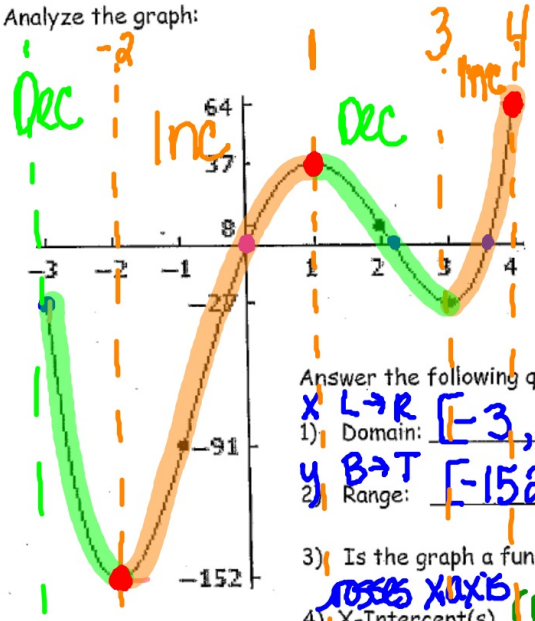
1.) Analyze the graph:



Answer the following questions related to the graph of the function above.

1) Domain: x L→R [-3, 4]

2) Range: y B→T [-152, 64]

3) Is the graph a function? yes (vertical line test)

4) X-Intercept(s) crosses x axis (0,0) (2.1,0) (3.4,0) Y-Intercept(s) crosses y axis (0,0)

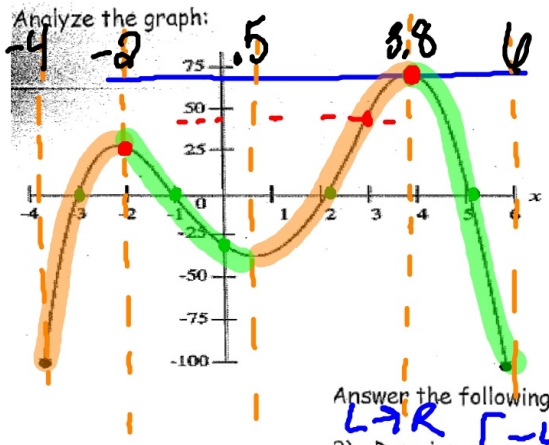
5) Where is the function increasing? (-2,1) and (3,4)

6) Where is the function decreasing? (-3,-2) and (1,3)

7) Evaluate f(1) = 37

8) Evaluate f(-2) + f(4) = -152 + 64 = -88

Analyze the graph:



Answer the following questions related to the graph of the function above.

9) Domain: $[-4, 6]$ $L \to R$

10) Range: $[-100, 70]$

11) Is the graph a function? yes

12) X-Intercept(s) $(-3,0)$ $(-1,0)$ $(2.1,0)$ $(5.1,0)$ Y-Intercept(s) $(0,-27)$

13) Where is the function increasing? $(-4,-2)$ and $(.5, 3.8)$

14) Where is the function decreasing? $(-2, .5)$ and $(3.8, 6)$

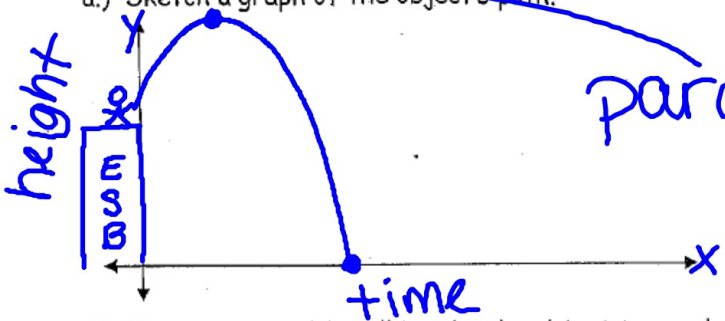
X values

15) Evaluate $f(3) =$ 40

16) Evaluate $f(-2) + f(4) =$ $25 + 70$ 95

2.) The Empire State Building s 1250 feet tall. If an object is thrown upward from the top of the building at an initial velocity of 38 feet per second, its height s seconds after it is thrown i given by the function $h(t) = -16s^2 + 38s + 1250$.

a.) Sketch a graph of the object's path.



b) How many seconds will it take the object to reach its maximum height?

xvalue vertex

$y = -16x^2 + 38x + 1250$

$a = -16 \quad b = 38 \quad c = 1250$

$\frac{-b}{2a}$

$\frac{-38}{2(-16)} = \frac{-38}{-32} =$ 1.1875 seconds

2.) The Empire State Building s 1250 feet tall. If an object is thrown upward from the top of the building at an initial velocity of 38 feet per second, its height s seconds after it is thrown is given by the function $h(t) = -16s^2 + 38s + 1250$.

c) What is the maximum height reached by the object?

vertex yvalue

$y = -16x^2 + 38x + 1250$

$-16(1.1875)^2 + 38(1.1875) + 1250$

1272.5625 ft

d) How many seconds will it take for the object to land on the ground?

height = 0

xvalue

(Hint: You should end up with 2 answers, but one of them is the correct answer.)

$0 = -16x^2 + 38x + 1250$ $\quad \frac{-38 \pm \sqrt{(38)^2 - 4(-16)(1250)}}{2(-16)}$

10.11 seconds

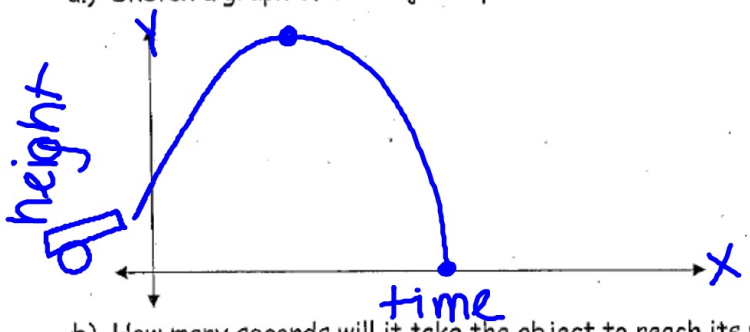
$$\frac{-38 \pm \sqrt{81444}}{-32}$$

$(-38 + \sqrt{81444})/-32 = -$~~7.73~~

$(-38 - \sqrt{81444})/-32 =$ 10.11 seconds

2.) YOU TRY: The height, h(t), in feet of an object shot from a cannon with an initial velocity of 20 feet per second from at height of 6 feet can be modeled by the equation $h(t) = -\frac{1}{2}t^2 + t + 24$, where t is the time in seconds after the cannon is fired.

a.) Sketch a graph of the object's path.



b) How many seconds will it take the object to reach its maximum height?

1 second

2.) YOU TRY: The height, h(t), in feet of an object shot from a cannon with an initial velocity of 20 feet per second from at height of 6 feet can be modeled by the equation $h(t) = -\frac{1}{2}t^2 + t + 24$, where t is the time in seconds after the cannon is fired.

c) What is the maximum height reached by the object?

$-\frac{1}{2}(1)^2 + 1 + 24 =$ 24.5 ft

d) How many seconds will it take for the object to land on the ground?

(Hint: You should end up with 2 answers, but one of them is the correct answer.)

-6 or 8

8 seconds

$-\frac{1}{2}t^2 + t + 24$

$a = -\frac{1}{2} \quad b = 1 \quad c = 24$

$$\frac{-1 \pm \sqrt{(1)^2 - 4\left(-\frac{1}{2}\right)(24)}}{2\left(-\frac{1}{2}\right)} = \frac{-1 \pm \sqrt{49}}{-1}$$